

XIII.—*The Moults and Plumages of the Common Moorhen*
(*Gallinula chloropus Linn.*). By C. H. B. GRANT.

(Text-figure 3.)

IN a collection of about 1760 skins of British Birds made by myself between the years 1894 and 1901, and which is about to be acquired by the British Museum, there is a series of 33 Moorhens which show interesting and instructive changes in the moults and plumages.

Among these are three adult and one second-year bird which have dropped completely the whole of the flight- and tail-feathers, being exactly in that state which is commonly met with in the Wild Duck (*Anas boschas*) and the South American White Swan (*Coscoroba candida*)*.

In the 'Birds of Britain,' published in 1907, Bonhote mentions this state of plumage occurring in the Coot (p. 291), where he says, "Although, as a rule, this bird casts its primaries at once, this is not invariably the case, as it sometimes moults them in pairs, like the majority of birds"; also in regard to the Land-Rail (p. 285) he writes as follows:—"During the autumn moult this species, in common with the others of its family, casts all its primaries at once, and is for about ten days incapable of flight." So that, though perhaps this state of plumage in the Moorhen is not altogether new, it has apparently been lost sight of since 1838, when Naumann (*Vög. Deutschl.* vol. ix. 1838, p. 595) merely says, in talking of the adults, "The moult is very quick in the old birds, and, as a rule, they cannot fly during this time, and are very retiring."

Since that work was published, I can find no reference to the moult of the Moorhen in any recent work on British Birds; in any case it appears so little known that it is well worth while again bringing it before the notice of ornithologists of to-day.

I propose to take the plumages in their sequence from

* 'Ibis,' 1911, p. 344.

the nestling to the full adults, including the annual moult, as follows:—

(1) *Nestling* (May to August).—Above glossy oily green, including wings; sides of head, throat, and neck with long silver-white tips; flanks sooty black; breast and abdomen sooty brown.

Soft parts: Irides hazel; bare skin of throat and neck chrome-yellow; beneath eye greenish yellow, above eye bright blue; head between eyes yellow; base of head reddish orange; egg-tooth yellow; beak reddish orange, dusky at tip; skin of wings yellow; legs and toes sooty.

In an older nestling, which is just showing signs of the first plumage, the back is more sooty black—that is to say, the oily green is less apparent.

In the soft parts the blue over the eye is gone and the yellow on the wings nearly gone.

(2) *1st plumage* (July and August).—Above olivaceous brown, with a very slight sheen; top of head and neck practically without sheen and slightly darker; flight-feathers and tail usually rather browner than in the adult; sides of head, chest, and flanks brown; throat white, fulvescent in youngest specimens; breast and belly whitish; abdomen white, tinged with fulvous in youngest specimens; flank-stripes fulvous white.

Soft parts: Irides greyish brown; bill in youngest specimens brown, light at tip, sometimes mottled with greenish, in older specimens more dull olive; legs and toes dark green, yellow on tibia.

The frontal shield is insignificant, and coloured like the beak.

One August bird is rapidly getting feathered, but the wings are still in the state of the nestling; another is almost fully fledged, the flight and tail-feathers coming in all together, as is normal in all birds assuming their first dress; two other August and one July bird are fully developed.

In September, October, and the first half of November, the birds are in their first moult, and are assuming the second plumage.

The whole of the body and head is in full moult, but not the wings and tail, which are therefore retained in their first plumage-state through their first winter, spring, and summer up to the following autumnal moult.

(3) *2nd plumage* (Oct. and Nov. till the following Aug.). Above but very slightly different from the adult (third plumage), except back and head, which is olivaceous brown, and some specimens having a tinge of slate intermixed; wings tail not having moulted are as in first plumage: below, chin and throat white, more or less mottled; neck, chest, and breast paler slate than in the adult, tipped and margined with ashy brown, giving the whole a fulvous appearance, more slaty and more fulvous in some individuals; belly and abdomen white or whitish; flanks sooty or slaty brown, in some, flank-stripes white and buff.

Soft parts in November birds: Irides greyish hazel, some tinged with reddish; bill greyish brown or dark olive, greenish at tip; legs and toes green, yellowish on tibia.

The frontal shield is but very slightly more developed than in the first plumage.

A month later, in December, the irides are reddish hazel; bill getting lighter at tip, in one specimen there is a distinct redness on the base of the bill; frontal shield developing.

In January birds the irides are crimson; bill bright red, tip bright yellow; legs dull green, yellow on front of tarsi; frontal shield well developed.

By April the irides have become crimson; bill vermilion or crimson, shading to pure tomato on shield, tip greenish yellow; legs and toes green, with imperfect red or yellow orange ring on tibia. The frontal shield is fully developed.

Thus it will be seen that with the bird in its second plumage the soft parts gradually change from the first plumage-coloration to that of the adult as the spring advances*.

One of the April birds is moulting on the head, so that it is possible some individuals do not always follow the general

* This agrees with what Macgillivray says (*cf.* 'History of British Birds,' vol. iv, 1852, p. 556).

rule, and this is borne out by a specimen shot at Sandford on the 4th of February, 1878, by Dr. R. B. Sharpe, which shows only the merest indication of the adult coloration on the beak and shield.

In July the soft parts are even more bright, especially the red-orange on the tibia. This July bird and the August one are very worn, and have lost most of the ashy brown, thus more nearly approaching adult birds taken in the same months; but the white throat is still distinct.

One of the August birds is starting the moult, but has not yet dropped the wings and tail, and the other is in the full "flapper" state, and is rapidly assuming the full adult dress (3rd plumage), though the white on the throat is still apparent.

Soft parts: Irides crimson or reddish brown; bill red at the base, greenish yellow at tip; legs and toes green, orange or red on tibia.

(4) *3rd plumage* (adult).—The adult plumage, which is attained in the second August when the birds are fifteen months old, needs no describing, except to say that there is no trace of white on the throat; the head and neck are dark slaty grey, and the flank-stripes are white. The amount of white on the abdomen seems variable and is probably individual. In all the adults before me there is more or less fulvous on the white under tail-coverts, so that this is not a character of the immature bird.

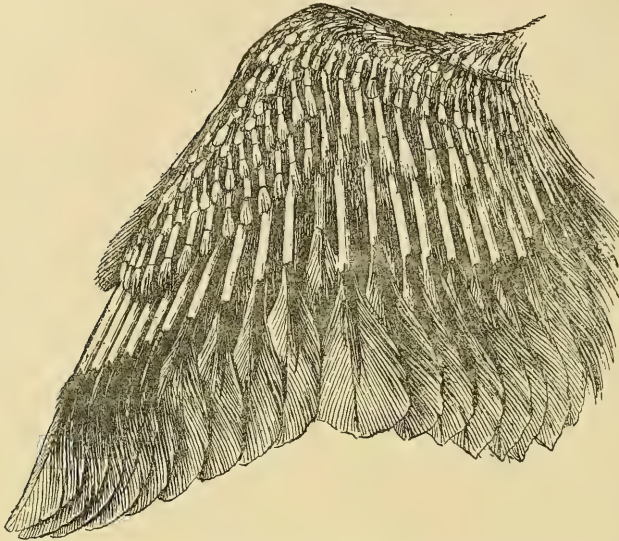
The annual moult of the adult takes place in August and September. Of the August birds, one has assumed the new wings and tail, but is still moulting on the body and head, and the others are all in the "flapper" state, one completely lacks the flight- and tail-feathers and the others are assuming them all together (text-fig. 3), and thus presenting the appearance of young birds donning their first dress.

The one September bird before me is also moulting, though the flight-feathers have not yet been dropped and are very worn.

From October onwards the birds are not moulting, and,

except for signs of wearing in the summer specimens, there is no difference between the winter and summer birds.

Text-fig. 3.



Underside of the right wing of an adult Moorhen in full moult.
(4 August, 1901.)

Soft parts: Irides crimson or reddish brown, bill and shield bright red, tip bright yellow; legs and toes green, yellower on front of tarsi; red or red-orange ring on tibia.

In the spring and summer the ring on the tibia and the yellow on the front of the tarsi and toes appears to be brighter.

In the 'Birds of Britain,' 1907, p. 290, Bonhote says: "Bill bright red at the base, with yellow tip in summer; dull olive-brown in autumn and early winter."

There is no doubt he has mistaken the immature bird (second plumage) for the adult in winter; as in the good series before me, there is no difference in the soft parts throughout the year, except for the apparent brightening of the ring and the yellow on the legs and toes. The shield also appears to be rather larger in summer than in winter.

Sexes.—I can see no real difference in colour between the male and female.

The flank-stripes seem to vary individually, though certainly some males have far broader ones than the females; I can see no difference in the under tail-coverts.

Measurements.—On the average the females are slightly smaller than the males both in total length (taken in the flesh) and in the wing-measurement; but this seems to alter somewhat according to the stage the bird happens to be in.

1st plumage: No males fully fledged; females, length $12\frac{1}{2}$ to 13 inches; wing 6·2 to 6·9 (157 to 175 mm.).

2nd plumage: Length, males, $13\frac{5}{8}$ to $14\frac{7}{8}$ inches; females, $12\frac{3}{4}$ to $14\frac{1}{4}$ inches. Wing, males, 6·7 to 7·2 inches (170 to 183 mm.); females, 6·4 to 6·8 inches (162 to 173 mm.).

3rd plumage (adult): Length, males, $14\frac{3}{8}$ to $15\frac{1}{2}$ inches; females, $13\frac{7}{8}$ to $14\frac{1}{8}$ inches. Wing, males, 6·8 to 7·4 inches (173 to 188 mm.); females, 6·6 to 7·0 (167 to 177 mm.).

Thus with the adult the males average in total length $14\frac{3}{4}$ inches and the females 14 inches, and in the wing the males average 7·1 inches (180 mm.) and the females 6·8 inches (173 mm.). Also the weight of the males is $12\frac{1}{2}$ to $13\frac{1}{2}$ oz. as against 10–11½ oz. in the females.

Of course, only fully fledged birds have been measured.

No fixed rules can be laid down as regards moults and changes of plumage, especially where series are compared that are not all killed in the same year, as there can be no doubt that slight variations occur in different years; but, if one year's series could be compared, I have no hesitation in saying that what I have described would be borne out at least in the main points.

I have to thank Mr. Ogilvie-Grant for so kindly allowing me access to the National Collection, where I have found a series of some 20 specimens from Great Britain, which, laid out alongside my own series, have considerably helped to bear out the above conclusions; though there is not one that is in full moult.

I have only been able to find one specimen in the National Collection that in any way shows this interesting state of

the moult, and that is a male bird from Kandahar, collected by Sir O. St. John on the 7th of April, 1879.

This bird has lost nearly all the primaries of both wings, but as the secondaries, the tail, and the plumage generally appear very little worn, and the bird is not otherwise moulting, I cannot help thinking that the lost feathers have been accidentally or purposely removed, and their non-existence is not, therefore, due to moult.

XIV.—*Remarks on the Geographical Distribution of the Chiffchaff and Willow-Warbler.* By Capt. HUBERT LYNES, R.N., M.B.O.U.

(Plate XII.)

IN the cork-woods of the Gibraltar neighbourhood during the last few days of April and first few of June 1913, we spent a good many hours over the "*Phylloscopus*" Warblers.

Irby (Ornith. Str. Gib. 2nd ed. 1895, pp. 63-64) records four species of *Phylloscopus* as breeding there: *P. bonellii*, *P. collybita*, *P. trochilus*, and *P. sibilatrix*, the two latter being comparatively scarce. Many writers follow suit, apparently quoting Irby, for I cannot find other independent observations of the same matter on record.

We found plenty of Willow- and Wood-Warblers during the April visit, when they were evidently on passage and without song, but none in June, and no evidence of either species breeding in the neighbourhood on either occasion.

Of the others, Bonellis were plentiful. Their poor song in April suggested only recent arrival in the neighbourhood, and we could find no nests, although in June we saw one brood abroad with their parents among the cork-trees.

The only other breeding *Phylloscopus* (so far as we could find), was *by its song*, I think anyone would have agreed, a Willow-Warbler; singing males of this species shared the cork-wood glades in about equal proportion with Bonellis. For a Willow-Warbler, true, the song was unmelodious and